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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/729,623 | 12/05/2003 | Carl L. Deppisch | P17175 | 2926 |
| 28062 | 7590 | 03/28/2006 | EXAMINER | |
| BUCKLEY, MASCHOFF, TALWALKAR LLC 5 ELM STREET NEW CANAAN, CT 06840 | | | ANDUJAR, LEONARDO | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2826 | |

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------|-----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/729,623 | DEPPISCH ET AL. | |
| | Examiner | Art Unit | |
| | Leonardo Andújar | 2826 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 11-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group I in the reply filed on 01/06/2006 is acknowledged.

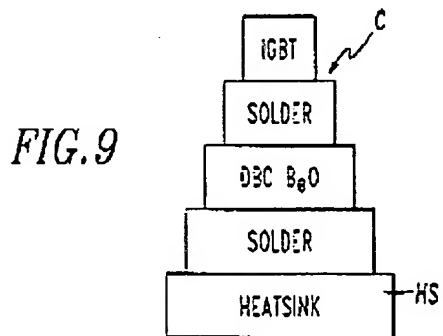
Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nguyen (US 5,892,279).
4. Regarding claim 1, Nguyen (e.g. fig. 9) teaches an apparatus comprising: a thermal conductor DBC; and a portion of solder material coupled to a first side of the thermal conductor (e.g. top side), wherein a voidless interface exists between the portion of solder material and the first side of the thermal conductor.



5. Regarding claim 2, Nguyen teaches a second portion of solder material coupled to a second side (e.g. bottom side) of the thermal conductor, wherein a second voidless interface exists between the second portion of solder material and the second side of the thermal conductor.

6. Regarding claim 3, Nguyen teaches a wherein a surface area of the second portion of solder material is greater than a surface area of the first portion of solder material.

7. Regarding claim 4, Nguyen (e.g. fig. 9) shows an apparatus comprising: an integrated heat spreader comprising a portion of solder material (e.g. solder) and a thermal conductor DBC, wherein a voidless interface exists between the solder material and a first side (e.g. top side) of the thermal conductor.

8. Regarding claim 5, Nguyen teaches an integrated circuit die (IGBT) coupled to a first side of the integrated heat spreader wherein the portion of solder material is disposed on the first side of the integrated heat spreader (e.g. top side).

9. Regarding claim 6, Nguyen teaches an integrated circuit package coupled to the integrated circuit die (e.g. fig. 10).

10. Regarding claim 7, Nguyen teaches that a heat sink HS coupled to a first side of the integrated heat spreader (e.g. thermally coupled).

11. Regarding claim 8, Nguyen teaches that the portion of solder material disposed on a second side of the integrated heat spreader (e.g. bottom side).

12. Regarding claim 9, Nguyen teaches that the integrated heat spreader comprises a second portion of solder material (solder) disposed on the first side of the integrated heat spreader.

13. Regarding claim 10, Nguyen teaches that the surface area of the second portion of solder material is greater than a surface area of the first portion of solder material.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 20020196650) in view of Nguyen (US 5,892,279).

16. Regarding claim 20, Chang (e.g. fig. 7A) shows a microprocessor comprising: an integrated circuit die 701 (CPU) and a double rate memory electrically 202 couple to the integrated circuit die (pp 0035). Chang does not disclose an integrated heat spreader comprising a portion solder material and a thermal conductor, wherein a voidless interface exists between the solder material and a first side of thermal conductor wherein the integrated circuit die is coupled to the solder material. However, Nguyen (e.g. fig. 9) shows integrated heat spreader comprising a portion solder material and a thermal conductor DBC, wherein a voidless interface exists between the solder material and a first side of thermal conductor. Also, the integrated circuit die (IGBT) is coupled to the solder material. According to Nguyen this type of embodiment provide an efficient

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heat management at low cost while provides smaller and lighter product (col. 3/lls. 39-47 & col. 4/lls. 60-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to package the CPU disclosed by Chang in accordance with Nguyen's invention which includes a integrated heat spreader comprising a portion solder material and a thermal conductor, wherein a voidless interface exists between the solder material and a first side of thermal conductor and wherein the integrated circuit die is coupled to the solder material in order to provide a package having an efficient heat management at low cost while provide smaller and lighter product.

17. Regarding claim 21, Chang discloses a motherboard 300 coupled to integrated circuit and to the memory (e.g. fig. 3).

18. Regarding claim 22, Nguyen shows a second portion of solder material, wherein a second voidless interface exists between the second portion of solder material and a second side of the thermal conductor.

19. Regarding claim 23, Nguyen shows a heat sink coupled to the second solder material.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kwon (e.g. fig. 5) shows embodiments similar to the instant invention.

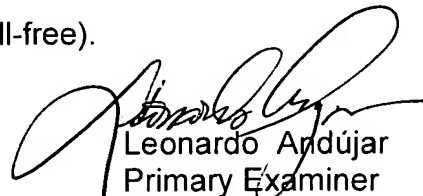
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-

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1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Leonardo Andújar
Primary Examiner
Art Unit 2826

03/02/2006